

CLAIMS

What is claimed is:

1. A process for passivating titanium dioxide nanoparticles comprising
 - 5 (a) forming a slurry of titanium dioxide nanoparticles;
 - (b) contacting the slurry of titanium dioxide nanoparticles with a densifying agent;
 - (c) forming silica coated titanium dioxide nanoparticles by contacting the slurry of step (b) with a source of silica
10 under conditions sufficient to deposit silica onto the titanium dioxide nanoparticles in an amount ranging from about 5 weight percent to about 18 weight percent based on the weight of the titanium dioxide nanoparticles in the mixture;
 - 15 (d) forming an alumina coating on the silica coated titanium dioxide nanoparticles by contacting the slurry of step (c) with a source of alumina under conditions sufficient to deposit alumina in an amount ranging from about 5 weight percent to about 15 weight percent based on the weight of
20 the titanium dioxide nanoparticles; and
 - (e) curing the titanium dioxide nanoparticles formed in step (d) to form silica and alumina coated titanium dioxide nanoparticles.
2. The process of Claim 1 further comprising contacting the slurry
25 of titanium dioxide nanoparticles with sodium aluminate prior to contacting the slurry with densifying agent.
3. The process of Claim 1 in which the conditions of forming silica coated titanium dioxide particles comprise contacting the titanium dioxide particles with sodium silica at a pH of at least about 10 and elevated
30 temperature.
4. The process of Claim 1 in which the conditions of forming an alumina coating comprise contacting the titanium dioxide with sodium aluminate at a pH ranging from about 5 to 9 and an elevated temperature.
5. The process of Claim 1 in which the densifying agent is added
35 to the slurry to a concentration based on the weight of the titanium dioxide nanoparticles of from about 0.1 to about 3%.
6. The process of Claim 1 further comprising contacting the silica and alumina coated titanium dioxide particles with an organic composition.

7. The process of Claim 6 in which the organic composition comprises at least one of octyltriethoxysilane, aminopropyltriethoxysilane, polyhydroxystearic acid, and polyhydroxy siloxide.

5 8. The process of Claim 1 in which the densifying agent is citric acid.

9. A composition for screening ultra violet radiation comprising silica and alumina coated titanium dioxide nanoparticles made by the process of Claims 1, 6, 8 or 9 dispersed in an organic or aqueous medium.

10 10. A method for reducing the chemical activity and photo activity of titanium dioxide nanoparticles comprising contacting an aqueous slurry of the titanium dioxide nanoparticles with a densifying agent; treating the aqueous slurry with a source of silica to form silica treated titanium dioxide nanoparticles; treating the silica treated titanium dioxide nanoparticles with a source of alumina to form silica and alumina treated titanium dioxide
15 nanoparticles.

11. The method of Claim 10 in which the densifying agent is citric acid.